

## WHAT IS CLAIMED IS:

1. A method of driving an active-matrix liquid-crystal display device including a liquid-crystal panel comprising:

a pair of substrates, at least one of which is a transparent substrate;

a plurality of data lines, which are each extended in a row direction on a specific one of said substrates and are arranged in a column direction perpendicularly intersecting said row direction;

a plurality of gate lines, which are each extended in said column direction and are arranged in said row direction;

an active device connected at an intersection of each of said data lines and each of said gate lines;

a pixel electrode driven by said active device;

an opposite electrode provided on said specific substrate or the other one of said substrates as an electrode sandwiching a liquid-crystal layer between said opposite electrode and said pixel electrode; and

a storage capacitor connected in parallel to said liquid-crystal layer;

wherein:

a frame period of an image displayed on said liquid-

crystal panel is divided into a scanning period and a hold period longer than said scanning period;

in said scanning period, image data of an amount corresponding to a frame is written into said liquid-crystal panel;

in said hold period following said scanning period, an off state is sustained;

an electric potential appearing on a positive-polarity data line in said hold period is increased to a level higher than an electric potential appearing on said opposite electrode where said positive-polarity data line is defined as said data line, on which an electric potential appears at a level higher than an electric potential appearing on said opposite electrode when an electric potential appearing on said gate line changes from an on-state level to an off-state level in said scanning period; and

an electric potential appearing on a negative-polarity data line in said hold period is decreased to a level lower than said electric potential appearing on said opposite electrode where said negative-polarity data line is defined as said data line provided on a row adjacent to said positive-polarity data line as said data line, on which an electric potential appears at a level lower than an electric potential appearing on said opposite electrode

when an electric potential appearing on said gate line changes from an on-state level to an off-state level in said scanning period.

2. A method of driving an active-matrix liquid-crystal display device according to claim 1 wherein said electric potential appearing on said positive-polarity data line in said hold period is set at a fixed level higher than said electric potential appearing on said opposite electrode and said electric potential appearing on said negative-polarity data line in said hold period is set at a fixed level lower than said electric potential appearing on said opposite electrode.

3. A method of driving an active-matrix liquid-crystal display device according to claim 1 wherein said electric potential  $V_{sig}$  [V] appearing on said positive-polarity data line in said hold period has a value in a range expressed in an MKSA unit system by relation (1) as follows:

$$V_{opt} - \left[ 1 + \frac{R_{off}}{R_1} \right] \frac{\Delta V_c(f)}{1 - e^{-\frac{1}{f\tau}}} \leq V_{sig} \leq V_{opt} + \left[ 1 + \frac{R_{off}}{R_1} \right] \frac{\Delta V_c(f)}{1 - e^{-\frac{1}{f\tau}}} \quad \dots (1)$$

where symbol  $\tau$  denotes a quantity expressed by the following equation:

$$\tau = \frac{R_1 \cdot R_{off}}{R_1 + R_{off}} (C_1 + C_{sig} + C_{sd}),$$

symbol  $V_{opt}$  denotes an electric potential expressed

by Eq. (2) as follows:

$$V_{opt} = V_{com} + \left(1 + \frac{R_{off}}{R_1}\right)(V_{fst} - V_{com}) \quad \dots (2)$$

symbol  $R_{off}$  denotes a resistance [ $\Omega$ ] exhibited by said active device when said active device is put in an off state;

symbol  $R_1$  denotes a resistance [ $\Omega$ ] exhibited by said liquid-crystal layer sandwiched by said pixel electrodes and said opposite electrode as a resistance expressed by the following equation:

$$R_1 = \frac{d}{S} \rho_{lc}$$

symbol  $S$  denotes the area [ $m^2$ ] of said pixel electrode;

symbol  $d$  denotes the thickness [ $m$ ] of said liquid-crystal layer;

symbol  $\rho_{lc}$  denotes the resistivity [ $\Omega m$ ] of a liquid crystal composing said liquid-crystal layer;

symbol  $V_{com}$  denotes said electric potential [ $V$ ] appearing on said opposite electrode;

symbol  $f$  denotes a frame frequency [ $Hz$ ];

symbol  $C_1$  denotes the capacitance [ $F$ ] of said liquid crystal of said liquid-crystal layer;

symbol  $C_{stg}$  denotes the capacitance [ $F$ ] of said storage capacitor;

symbol  $C_{sd}$  denotes the capacitance [ $F$ ] of a

parasitic capacitor existing between said pixel electrode and said data line for said pixel electrode;

symbol  $V_{fst}$  denotes an electric potential [V] appearing on said pixel electrode right after an on-state period in said frame period of said pixel;

symbol  $\Delta V_c(f)$  denotes a change [V] in critical electric potential for said frame frequency  $f$  and said electric potential  $V_{fst}$  appearing on said pixel electrode right after said on-state period;

symbol  $V_{opt}$  denotes an optimum electric potential [V] with said electric potential  $V_{fst}$  of said pixel electrode held as it is; and

symbol  $V_{sig}$  denotes an electric potential  $V_{sig}$  [V] appearing on said positive-polarity data line in said hold period.

4. A method of driving an active-matrix liquid-crystal display device in accordance with claim 3 wherein a value of  $V_{fst}$  used in said Eq. (2) is set at  $(V_{com} + V_{op})$  in determining a range of possible values for said electric potential appearing on said positive-polarity data line or  $(V_{com} - V_{om})$  in determining a range of possible values for said electric potential appearing on said negative-polarity data line where:

symbol  $V_{op}$  denotes an absolute value of an electric potential, which appears on said positive-polarity data

line when a change of a transmittance or a reflectance of said liquid-crystal panel reaches a maximum accompanying a change of said voltage appearing on said liquid crystal in a range of voltages appearing on said liquid crystal as voltages used in a display; and

symbol  $V_{om}$  denotes an absolute value of an electric potential, which appears on said negative-polarity data line when a change of said transmittance or said reflectance of said liquid-crystal panel reaches a maximum accompanying a change of said voltage appearing on said liquid crystal in said range of voltages appearing on said liquid crystal as voltages used in a display.

5. A method of driving an active-matrix liquid-crystal display device in accordance with claim 3 wherein:

in determining a range of possible values for said electric potential appearing on said positive-polarity data line, the value of  $V_{fst}$  used in Eq. (2) is set at said electric potential appearing on said pixel electrode right after said on-state period as an electric potential corresponding to image data of a tone adjacent to a tone showing a transmittance or a reflectance equal to about half a maximum transmittance or a maximum reflectance respectively in a positive-polarity frame period comprising a specific one of said scanning periods and said hold period following said specific scanning period where said

specific scanning period is a period in which said electric potential appearing on said data line is set at a level higher than said electric potential appearing on said opposite electrode when an electric potential appearing on said gate line changes from an on-state level to an off-state level in said scanning period; and

in determining a range of possible values for said electric potential appearing on said negative-polarity data line, the value of  $V_{fst}$  used in Eq. (2) is set at said electric potential appearing on said pixel electrode right after said on-state period as an electric potential corresponding to image data of a tone adjacent to a tone showing a transmittance or a reflectance equal to about half a maximum transmittance or a maximum reflectance respectively in a negative-polarity frame period comprising a specific one of said scanning periods and said hold period following said specific scanning period where said specific scanning period is a period in which said electric potential appearing on said data line is set at a level lower than said electric potential appearing on said opposite electrode when an electric potential appearing on said gate line changes from an on-state level to an off-state level in said scanning period.

6. A method of driving an active-matrix liquid-crystal display device according to claim 1 wherein:

said electric potential  $V_{sig}$  [V] appearing on said positive-polarity data line in said hold period is set at approximately a value expressed in an MKSA unit system by Eq. (3) as follows:

$$V_{sig} = V_{com} + \left[ 1 + \frac{R_{off}}{\rho l c \frac{d}{s}} \right] \times V_0 \quad \dots (3)$$

and

said electric potential  $V_{sig}$  [V] appearing on said negative-polarity data line in said hold period is set at approximately a value expressed in an MKSA unit system by Eq. (4) as follows:

$$V_{sig} = V_{com} - \left[ 1 + \frac{R_{off}}{\rho l c \frac{d}{s}} \right] \times V_0 \quad \dots (4)$$

where symbol  $V_0$  denotes an absolute value [V] of a voltage appearing on said liquid crystal as a voltage corresponding to any arbitrary image data.

7. A method of driving an active-matrix liquid-crystal display device in accordance with claim 6 wherein, when an electric potential appearing on a gate line in a scanning period of a frame period has been set at an on-state level, said electric potential appearing on said data line has been set at a level for writing desired image data and, right after that, all said gate lines have been put in an off state,



desired image data is written into all said pixels by carrying out driving repeatedly on each of said gate lines to:

set said electric potential appearing on said data line, which serves as said positive-polarity data line, at a level symmetrical with respect to an electric potential appearing on said positive-polarity data line in said on-state period with its center of symmetry coinciding with a data-line electric potential approximately equal to a quantity expressed by said Eq. (3); and

set said electric potential appearing on said data line, which serves as said negative-polarity data line, at a level symmetrical with respect to an electric potential appearing on said negative-polarity data line in said on-state period with its center of symmetry coinciding with a data-line electric potential approximately equal to a quantity expressed by said Eq. (4).

8. A method of driving an active-matrix liquid-crystal display device in accordance with claim 6 wherein:

driving is carried out on k gate lines of said gate lines to set said electric potentials appearing on said k gate lines in said scanning period of said frame period at an on-state level, set said electric potential appearing on said data line at levels for writing pieces of desired picture data and write said electric potentials

corresponding to said pieces of desired image data into said pixel electrodes;

right after that, all said gate lines are put in an off state; and

desired picture data is written into all said pixels by carrying out driving repeatedly on each of said k gate lines to:

set each of k electric potentials appearing on said data line, which serves as said positive-polarity data line, at a level approximately symmetrical with respect to an electric potential appearing on said positive-polarity data line in a period of scanning said k gate lines as one of k electric potentials each corresponding to one of said k pieces of desired image data for an arbitrary period length with its center of symmetry coinciding with a data-line electric potential equal to a quantity expressed by said Eq. (3); and

set each of k electric potentials appearing on said data line, which serves as said negative-polarity data line, at a level approximately symmetrical with respect to an electric potential appearing on said negative-polarity data line in a period of scanning said k gate lines as one of k electric potentials each corresponding to one of said k pieces of desired image data for an arbitrary period length with its center of symmetry coinciding with a data-line

electric potential equal to a quantity expressed by said Eq. (4).

9. A method of driving an active-matrix liquid-crystal display device in accordance with claim 6 wherein:

driving is carried out on k gate lines of said gate lines to set said electric potentials appearing on said k gate lines in said scanning period of said frame period at an on-state level, set said electric potential appearing on said data line at levels for writing pieces of desired image data and write said electric potentials corresponding to said pieces of desired data into said pixel electrodes;

right after that, all said gate lines are put in an off state; and

desired image data is written into all said pixels by carrying out driving repeatedly on each of said k gate lines to:

set said electric potential appearing on said data line, which serves as said positive-polarity data line, at a level approximately symmetrical with respect to an average of electric potentials appearing on said positive-polarity data line in a period of scanning said k gate lines as k electric potentials each corresponding to one of said k pieces of desired data with its center of symmetry coinciding with a data-line electric potential equal to a quantity expressed by said Eq. (3); and

set said electric potential appearing on said data line, which serves as said negative-polarity data line, at a level approximately symmetrical with respect to an average of electric potentials appearing on said negative-polarity data line in a period of scanning said  $k$  gate lines as  $k$  electric potentials each corresponding to one of said  $k$  pieces of desired image data with its center of symmetry coinciding with a data-line electric potential equal to a quantity expressed by said Eq. (4).

10. A method of driving an active-matrix liquid-crystal display device in accordance with claim 6 wherein a quantity represented by symbol  $V_0$  in Eqs. (3) and (4) as the absolute value of said voltage appearing on said liquid crystal is set at a magnitude equal to about an effective value of said liquid-crystal voltage for which a change in transmittance or reflectance reaches a maximum accompanying a change of said voltage appearing on said liquid crystal as a voltage used in a display.

11. A method of driving an active-matrix liquid-crystal display device in accordance with claim 6 wherein:

a quantity represented by symbol  $V_0$  in Eq. (3) as the absolute value of said voltage appearing on said liquid crystal is set at the absolute value of said voltage appearing on said liquid crystal for a positive polarity for which a transmittance or a reflectance of said liquid-

crystal display device is equal to about half a maximum transmittance or a maximum reflectance respectively in a positive-polarity frame period; and

a quantity represented by symbol  $V_0$  in Eq. (4) as the absolute value of said voltage appearing on said liquid crystal is set at the absolute value of said voltage appearing on said liquid crystal for a negative polarity for which said transmittance or said reflectance of said liquid-crystal display device is equal to about half said maximum transmittance or said maximum reflectance respectively in a negative-polarity frame period.

12. A method of driving an active-matrix liquid-crystal display device according to claim 1 wherein, as said electric potential appearing on said data line in said hold period:

said electric potential appearing on said positive-polarity data line in said hold period is set at a level minimizing a change of a transmittance or a reflectance of a tone showing a transmittance or a reflectance equal to about half a maximum transmittance or a maximum reflectance respectively in a positive-polarity frame period of said pixel connected to a specific one of said scanning lines, which is close to the last one of said gate lines; and

said electric potential appearing on said negative-polarity data line in said hold period is set at a level

minimizing a change of a transmittance or a reflectance of a tone showing a transmittance or a reflectance equal to about half a maximum transmittance or a maximum reflectance respectively in a negative-polarity frame period of said pixel connected to a specific one of said scanning lines, which is close to the last one of said gate lines.

13. An active-matrix liquid-crystal display device including a liquid-crystal panel comprising:

- a pair of substrates, at least one of which is a transparent substrate;

- a plurality of data lines, which are each extended in a row direction on a specific one of said substrates and are arranged in a column direction perpendicularly intersecting said row direction;

- a plurality of gate lines, which are each extended in said column direction and are arranged in said row direction;

- an active device connected at an intersection of each of said data lines and each of said gate lines;

  - a pixel electrode driven by said active device;

  - an opposite electrode provided on said specific substrate or the other one of said substrates as an electrode sandwiching a liquid-crystal layer between said opposite electrode and said pixel electrode; and

  - a storage capacitor connected in parallel to said

liquid-crystal layer;

wherein:

a frame period of an image displayed on said liquid-crystal panel is divided into a scanning period and a hold period longer than said scanning period;

in said scanning period, image data of an amount corresponding to a frame is written into said liquid-crystal panel;

in said hold period following said scanning period, an off state is sustained; and

said liquid-crystal display device includes a scanning-period electric-potential control means for controlling an electric potential in said hold period; and wherein:

said scanning-period electric-potential control means increases an electric potential appearing on a positive-polarity data line in said hold period to a level higher than an electric potential appearing on said opposite electrode where said positive-polarity data line is defined as said data line, on which an electric potential appears at a level higher than an electric potential appearing on said opposite electrode when an electric potential appearing on said gate line changes from an on-state level to an off-state level in said scanning period; and

said scanning-period electric-potential control

means decreases an electric potential appearing on a negative-polarity data line in said hold period to a level lower than said electric potential appearing on said opposite electrode where said negative-polarity data line is defined as said data line provided on a row adjacent to said positive-polarity data line as said data line, on which an electric potential appears at a level lower than an electric potential appearing on said opposite electrode when an electric potential appearing on said gate line changes from an on-state level to an off-state level in said scanning period.

14. A liquid-crystal display device according to claim 13, further comprising a gate-line-scanning circuit for scanning said gate lines;  
wherein:

said gate-line-scanning circuit includes a shift register for selecting any of said gate lines, and said shift register includes a spare register for putting all said gate lines in an off state.

15. A liquid-crystal display device according to claim 13 wherein:

said active device provided is a thin-film transistor; and

said thin-film transistor provided for a pixel is located in a middle location between a specific one of said



data lines and an adjacent one of said data lines where said specific data line is defined as a data line connected to a source of said thin-film transistor and said adjacent data line is defined as a data line located on a pixel side opposite to said specific data line to sandwich said pixel between said adjacent data line and said specific data line.

16. A liquid-crystal display device according to claim 13 wherein:

said active device is a thin-film transistor; and  
in said pixel electrode for a pixel, an electrode portion made of a reflective material having electro conductivity is provided at such a location that said thin-film transistor for said pixel is positioned at a center of said electrode portion made of a reflective material having electro conductivity.

17. A liquid-crystal display device according to claim 13 wherein:

said active device is a thin film transistor;  
pixels are arranged to form an  $N \times M$  matrix comprising  $N$  rows and  $M$  columns; and

said matrix includes a portion in which, if a source of said thin-film transistor provided for a specific pixel located at an intersection of the  $n$ th row and  $m$ th column of said matrix is connected to one of two data lines adjacent to said pixel where  $n$  is an integer in the range 1 to  $(N -$

1 ) and  $m$  is an integer in the range 1 to  $M$ , a source of a thin-film transistor provided for a pixel located at an intersection of the  $(n + 1)$ th row and said  $m$ th column is connected to one of said two adjacent data lines, which is not connected to said source of said thin-film transistor provided for said specific pixel.

18. A liquid-crystal display device according to claim 17 wherein, if the number of said data lines is  $(M + 1)$ , said data line on the first column is connected to said data line on the  $(M + 1)$ th column.

19. A method of driving an active-matrix liquid-crystal display device in accordance with claim 2 wherein:  
said fixed electric potential appearing on said positive-polarity data line in said hold period is set at a level higher than a sum  $(V_{com} + V_p)$  of an electric potential  $V_{com}$  appearing on said opposite electrode and an absolute value  $V_p$  of a voltage appearing on said crystal liquid for a positive polarity defined as a polarity for which an electric potential appearing on said pixel electrode is higher than an electric potential appearing on said opposite electrode facing said pixel electrode to provide a gap for sandwiching said liquid-crystal layer with a tone showing a transmittance or a reflectance equal to about half a maximum transmittance or a maximum reflectance respectively among transmittance or reflectance

values in a range of voltages appearing on said liquid crystal as voltages used in a display; and

said fixed electric potential appearing on said negative-polarity data line in said hold period is set at a level lower than a sum ( $V_{com} - V_m$ ) of said electric potential  $V_{com}$  and an absolute value  $V_m$  of a voltage appearing on said crystal liquid for a negative polarity defined as a polarity for which an electric potential appearing on said pixel electrode is lower than an electric potential appearing on said opposite electrode facing said pixel electrode to provide a gap for sandwiching said liquid-crystal layer with a tone showing a transmittance or a reflectance equal to about half a maximum transmittance or a maximum reflectance respectively among transmittance or reflectance values in said range of voltages appearing on said liquid crystal as voltages used in a display.

20. A method of driving an active-matrix liquid-crystal display device in accordance with claim 2 wherein:

said fixed electric potential appearing on said positive-polarity data line in said hold period is set at a level higher than  $(V_{sp50} - \Delta V_{ft})$  and said fixed electric potential appearing on said negative-polarity data line in said hold period is set at a level lower than  $(V_{sm50} - \Delta V_{ft})$ ,  
 where:

symbol  $V_{sp50}$  denotes an electric potential appearing on said positive-polarity data line as an electric potential corresponding to a tone showing a transmittance or a reflectance equal to about half a maximum transmittance or a maximum reflectance respectively among transmittance or reflectance values in a range of voltages appearing on said liquid crystal as voltages used in a display;

symbol  $V_{sm50}$  denotes an electric potential appearing on said negative-polarity data line as an electric potential corresponding to a tone showing a transmittance or a reflectance equal to about half a maximum transmittance or a maximum reflectance respectively among transmittance or reflectance values in said range of voltages appearing on said liquid crystal as voltages used in a display; and

symbol  $\Delta V_{ft}$  denotes a quantity expressed by Eq. (5) as follows:

$$\Delta V_{ft} = \left[ \frac{V_{sp50} + V_{sm50}}{2} \right] - V_{com} \quad \dots (5)$$

21. A method of driving an active-matrix liquid-crystal display device in accordance with claim 2 wherein:

said fixed electric potential appearing on said positive-polarity data line in said hold period is set at a level higher than  $V_{sp50}$  and said fixed electric potential appearing on said negative-polarity data line in said hold

period is set at a level lower than  $V_{sm50}$ ,  
 where:

symbol  $V_{sp50}$  denotes an electric potential appearing on said positive-polarity data line as an electric potential corresponding to a tone showing a transmittance or a reflectance equal to about half a maximum transmittance or a maximum reflectance respectively among transmittance or reflectance values in a range of voltages appearing on said liquid crystal as voltages used in a display; and

symbol  $V_{sm50}$  denotes an electric potential appearing on said negative-polarity data line as an electric potential corresponding to a tone showing a transmittance or a reflectance equal to about half a maximum transmittance or a maximum reflectance respectively among transmittance or reflectance values in said range of voltages appearing on said liquid crystal as voltages used in a display.

22. A method of driving an active-matrix liquid-crystal display device according to claim 1 wherein:

said electric potential appearing on said positive-polarity data line in said hold period is driven to vibrate with a vibration center coinciding with a level higher than a sum ( $V_{com} + V_p$ ) of an electric potential  $V_{com}$  appearing on said opposite electrode and an absolute value  $V_p$  of a

voltage appearing on said crystal liquid for a positive polarity defined as a polarity for which an electric potential appearing on said pixel electrode is higher than an electric potential appearing on said opposite electrode facing said pixel electrode to provide a gap for sandwiching said liquid-crystal layer with a tone showing a transmittance or a reflectance equal to about half a maximum transmittance or a maximum reflectance respectively among transmittance or reflectance values in a range of voltages appearing on said liquid crystal as voltages used in a display; and

said electric potential appearing on said negative-polarity data line in said hold period is driven to vibrate with a vibration center coinciding with a level lower than a sum ( $V_{com} - V_m$ ) of said electric potential  $V_{com}$  and an absolute value  $V_m$  of a voltage appearing on said crystal liquid for a negative polarity defined as a polarity for which an electric potential appearing on said pixel electrode is lower than an electric potential appearing on said opposite electrode facing said pixel electrode to provide a gap for sandwiching said liquid-crystal layer with a tone showing a transmittance or a reflectance equal to about half a maximum transmittance or a maximum reflectance respectively among transmittance or reflectance values in said range of voltages appearing on said liquid

crystal as voltages used in a display.

23. A method of driving an active-matrix liquid-crystal display device according to claim 1 wherein:

said electric potential appearing on said positive-polarity data line in said hold period is driven to vibrate with a vibration center coinciding with a level higher than  $(V_{sp50} - \Delta V_{ft})$  and said electric potential appearing on said negative-polarity data line in said hold period is driven to vibrate with a vibration center coinciding with a level lower than  $(V_{sm50} - \Delta V_{ft})$ ,

where:

symbol  $V_{sp50}$  denotes an electric potential appearing on said positive-polarity data line as an electric potential corresponding to a tone showing a transmittance or a reflectance equal to about half a maximum transmittance or a maximum reflectance respectively among transmittance or reflectance values in a range of voltages appearing on said liquid crystal as voltages used in a display;

symbol  $V_{sm50}$  denotes an electric potential appearing on said negative-polarity data line as an electric potential corresponding to a tone showing a transmittance or a reflectance equal to about half a maximum transmittance or a maximum reflectance respectively among transmittance or reflectance values in said range of

voltages appearing on said liquid crystal as voltages used in a display; and

symbol  $\Delta V_{ft}$  denotes a quantity expressed by Eq. (5) as follows:

$$\Delta V_{ft} = \left[ \frac{V_{sp50} + V_{sm50}}{2} \right] - V_{com} \quad \dots (5)$$

24. A method of driving an active-matrix liquid-crystal display device according to claim 1 wherein:

said electric potential appearing on said positive-polarity data line in said hold period is driven to vibrate with a vibration center coinciding with a level higher than  $V_{sp50}$  and said electric potential appearing on said negative-polarity data line in said hold period is driven to vibrate with a vibration center coinciding with a level lower than  $V_{sm50}$ ,  
where:

symbol  $V_{sp50}$  denotes an electric potential appearing on said positive-polarity data line as an electric potential corresponding to a tone showing a transmittance or a reflectance equal to about half a maximum transmittance or a maximum reflectance respectively among transmittance or reflectance values in a range of voltages appearing on said liquid crystal as voltages used in a display; and

symbol  $V_{sm50}$  denotes an electric potential appearing on said negative-polarity data line as an electric



potential corresponding to a tone showing a transmittance or a reflectance equal to about half a maximum transmittance or a maximum reflectance respectively among transmittance or reflectance values in said range of voltages appearing on said liquid crystal as voltages used in a display.

25. A method of driving an active-matrix liquid-crystal display device in accordance with claim 2 wherein said fixed electric potential appearing on said positive-polarity data line in said hold period and said fixed electric potential appearing on said negative-polarity data line in said hold period are set at such values that an absolute value of a difference between said fixed electric potential appearing on said positive-polarity data line and an electric potential appearing on said opposite electrode is approximately equal to an absolute value of a difference between said fixed electric potential appearing on said negative-polarity data line and said electric potential appearing on said opposite electrode.

26. A method of driving an active-matrix liquid-crystal display device in accordance with claim 2 wherein said fixed electric potential appearing on said positive-polarity data line in said hold period and said fixed electric potential appearing on said negative-polarity data line in said hold period are set at such values that an

absolute value of a difference between said fixed electric potential appearing on said positive-polarity data line and a data-line center electric potential is approximately equal to an absolute value of a difference between said fixed electric potential appearing on said negative-polarity data line and said data-line center electric potential where said data-line center electric potential is defined as a center electric potential between maximum and minimum values of electric potentials each appearing on said data lines as an electric potential used in a display.

27. A method of driving an active-matrix liquid-crystal display device in accordance with claim 26 wherein a parasite capacitance between said pixel electrode and one of two data lines adjacent to said pixel electrode is approximately equal to a parasite capacitance between said pixel electrode and the other one of said data lines adjacent to said pixel electrode.

28. A method of driving an active-matrix liquid-crystal display device in accordance with claim 2 wherein a horizontal period of a scanning period of a frame includes a period for setting said electric potential appearing on said data line at any arbitrary level in addition to a period for setting said electric potential appearing on said data line at a level corresponding to desired image data.

29. A method of driving an active-matrix liquid-crystal display device in accordance with claim 28 wherein said period for setting said electric potential appearing on said data line at any arbitrary level is a period during which said positive-polarity data line is short-circuited to said negative-polarity data line.

30. A method of driving an active-matrix liquid-crystal display device in accordance with claim 28 wherein said period for setting said electric potential appearing on said data line at any arbitrary level is a period during which said positive-polarity data line, said negative-polarity data line, said opposite electrode and said storage line are short-circuited to each other.

31. A method of driving an active-matrix liquid-crystal display device in accordance with claim 28 wherein said period for setting said electric potential appearing on said data line at any arbitrary level is a period during which said electric potential appearing on said data line is set at a level equal to or lower than said electric potential appearing on said opposite electrode in a case where said data line is said positive-polarity data line or a level equal to or higher than said electric potential appearing on said opposite electrode in a case where said data line is said negative-polarity data line.

32. A method of driving an active-matrix liquid-

crystal display device in accordance with claim 28 wherein said period for setting said electric potential appearing on said data line at any arbitrary level is a period during which said electric potential appearing on said data line is set at said electric potential appearing on said negative-polarity data line in said hold period in a case where said data line is said positive-polarity data line or at said electric potential appearing on said positive-polarity data line in said hold period in a case where said data line is said negative-polarity data line.

33. A method of driving an active-matrix liquid-crystal display device in accordance with claim 28 wherein said period for setting said electric potential appearing on said data line at any arbitrary level is a period during which said electric potential appearing on said data line is set at a minimum value of said electric potentials each appearing on said data line as an electric potential used in a display in a case where said data line is said positive-polarity data line or at a maximum value of said electric potentials each appearing on said data line as an electric potential used in a display in a case where said data line is said negative-polarity data line.

34. A method of driving an active-matrix liquid-crystal display device in accordance with claim 2 wherein:  
a horizontal period of a scanning period of a frame

includes a specific period for setting all said gate lines in an off state and setting said electric potential appearing on said data line at any arbitrary level in addition to a period for setting said electric potential appearing on said gate line at an on-state level, setting said electric potential appearing on said data line at a level for writing desired image data and applying an electric potential for writing said desired image data to said pixel electrode; and

one or more said specific periods are provided in said scanning period before said image data is written into a pixel connected to a last gate line.

35. A method of driving an active-matrix liquid-crystal display device in accordance with claim 34 wherein said specific period for setting said electric potential appearing on said data line at any arbitrary level is a period during which said electric potential appearing on said data line is set at a level equal to or lower than said electric potential appearing on said opposite electrode in a case where said data line is said positive-polarity data line or a level equal to or higher than said electric potential appearing on said opposite electrode in a case where said data line is said negative-polarity data line.

36. A method of driving an active-matrix liquid-

crystal display device in accordance with claim 34 wherein said specific period for setting said electric potential appearing on said data line at any arbitrary level is a period during which an absolute value of a difference between said fixed electric potential appearing on said positive-polarity data line and an electric potential appearing on said opposite electrode is approximately equal to an absolute value of a difference between said fixed electric potential appearing on said negative-polarity data line and said electric potential appearing on said opposite electrode.

37. A method of driving an active-matrix liquid-crystal display device in accordance with claim 34 wherein said specific period for setting said electric potential appearing on said data line at any arbitrary level is a period during which said electric potential appearing on said data line is set at said electric potential appearing on said negative-polarity data line in said hold period in a case where said data line is said positive-polarity data line or at said electric potential appearing on said positive-polarity data line in said hold period in a case where said data line is said negative-polarity data line.

38. A method of driving an active-matrix liquid-crystal display device in accordance with claim 34 wherein said specific period for setting said electric potential

appearing on said data line at any arbitrary level is a period during which said positive-polarity data line is short-circuited to said negative-polarity data line.

39. A method of driving an active-matrix liquid-crystal display device in accordance with claim 34 wherein said specific period for setting said electric potential appearing on said data line at any arbitrary level is a period during which said positive-polarity data line, said negative-polarity data line, said opposite electrode and said storage line are short-circuited to each other.